



The role of parental understanding and perceptions of obesity cannot be overstated in tackling this public health crisis (Townshend & Lake, 2017). Parents' knowledge and beliefs about healthy eating and physical activity significantly influence their children's behaviors and lifestyle habits, which in turn impact their weight status (Moore et al., 2017). Furthermore, parents often struggle to recognize their child's overweight or obesity status due to a phenomenon known as "weight perception gap," which impedes efforts to prevent or manage obesity (Penilla et al., 2017). Research indicates that improved parental awareness and understanding about obesity could contribute to more effective preventive and management strategies (Brown & Perrin, 2018).

However, our understanding of parents' perceptions about childhood obesity, particularly within the Saudi context, remains limited (Alodainy, 2022). Research to date has primarily focused on objective measures of obesity, such as BMI and waist circumference, with less attention paid to parental perceptions, knowledge, and attitudes (Pearl & Puhl, 2018). The lack of cultural and context-specific understanding about parents' perceptions of childhood obesity creates a significant gap in our ability to implement effective prevention and intervention strategies (Agard et al., 2021).

The primary aim of this study is to address the existing research gap by investigating parents' perceptions of childhood obesity of children who visit the pediatrics Outpatient Department (OPD) at King Saud University Medical City. This research will probe into the level of awareness, misconceptions, and attitudes among parents about childhood obesity, its causes, consequences, and prevention strategies. Understanding the nuances of parents' perceptions in this setting is paramount to designing tailored intervention strategies that can effectively address the alarming increase of childhood obesity in Saudi Arabia. By providing a comprehensive picture of the knowledge, attitudes, and practices of parents regarding childhood obesity, this study endeavors to offer valuable insights that will aid in formulating effective, culturally appropriate strategies to curb this growing public health issue.

The findings from this study could be instrumental in formulating effective, culturally-sensitive strategies to combat this growing health issue. By understanding parents' perspectives, health professionals, educators, and policy-makers can tailor interventions to promote healthy eating and physical activity behaviors in children. This, in turn, can increase the effectiveness of interventions by making them more applicable and acceptable to the target population.

## Methodology

### Research Design

This cross-sectional research was conducted at King Saud University Medical City (KSUMC) in Riyadh. The focus was on the parents of obese children who were patients at the general pediatric clinic at KSUMC. This population was deemed to be representative of the wider community given the diverse range of patients who visited the hospital.

The study utilized a random sampling method where parents of children meeting the inclusion criteria were selected from the list of patients at the general pediatric clinic at KSUMC. The inclusion criteria for the study were: parents of children aged between 4 to 14 years with a BMI > 30, who attended the general pediatric clinic at KSUMC in Riyadh. Parents of children aged less than 4 years or older than 14 years, those suffering from chronic diseases, and those with developmental delays were excluded from the study.

A G\*Power analysis was conducted to determine the necessary sample size, with a power of 0.80 and alpha at 0.05, which yielded a required sample size of 296. However, to account for potential incomplete responses or dropouts, a total of 305 participants were recruited.

### Data Collection Tool

A structured questionnaire in Arabic was distributed among the parents through online (whatsapp) randomly from the list of clinics to assess their perception of their child's weight, the relation of lifestyle to their awareness, and complications of obesity. The questionnaire consisted of questions exploring perceptions about obesity, awareness of BMI measurements, their children's eating habits, physical activity, time spent on electronic devices, and potential health problems related to obesity.

To ensure the validity and reliability of the data collection tool, a pilot study was conducted with a small group of 30 participants, resembling the study sample. The questionnaire was administered to the pilot group, and their feedback was carefully analyzed. Based on the feedback received, necessary modifications and improvements were made to the questionnaire to enhance its clarity and comprehensibility. Additionally, the content validity of the questionnaire was assessed by subjecting it to review by experts in the field, who evaluated the relevance and appropriateness of the questions. To measure the internal consistency of the questionnaire, Cronbach's alpha coefficient was calculated, resulting in a value of  $\alpha = 0.82$ , indicating high reliability.

Upon completion of data collection, the responses were entered and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to summarize the demographic data and responses to the questionnaire.

This study adhered to the principles of the Declaration of Helsinki, with approval obtained from the Institutional Review Board (IRB) at King Saud University. Prior to data collection, informed consent was obtained from the participants, ensuring they understood the study's purpose and their rights as participants. Confidentiality and anonymity were maintained throughout the study, with personal identifiers removed during the data analysis process.

## Results

In this study, a total of 305 parents participated. The baseline socio-demographic characteristics of the enrolled parents are presented in Table 1. Concerning

the age of their children, 71 parents (23.3%) had children aged 4 to less than 8 years, 141 parents (46.2%) had children aged 8 to less than 10 years, and 93 parents (30.5%) had children aged 10 to 14 years. The mean age of the parents was 36.4 years with a standard deviation of 4.15 years. Regarding educational qualifications, a minority of the parents were illiterate (1.6%,  $n = 5$ ), 6.6% ( $n = 20$ ) had less than secondary school education, 3.9% ( $n = 12$ ) held a diploma, a substantial majority had a bachelor's degree (80.7%,  $n = 246$ ), and 7.2% ( $n = 22$ ) had completed postgraduate studies.

In terms of monthly income, 10.2% ( $n = 31$ ) of the parents earned less than 5000 SAR, 37% ( $n = 113$ ) earned between 5001 and less than 10000 SAR, 29.5% ( $n = 90$ ) earned between 10000 and less than 15000 SAR, and 23.3% ( $n = 71$ ) earned more than 15000 SAR. Finally, regarding the living region of the participants, a majority resided in urban areas (71.8%,  $n = 219$ ), while 28.2% ( $n = 86$ ) lived in rural areas.

**Table 1. Baseline socio-demographic characteristics of the enrolled parents (n=305)**

Variable	F (%)
Age of the child	
1. 4-less than 8 years	71 (23.3%)
2. 8-less than 10 years	141 (46.2%)
3. 10 – 14 years	93 (30.5%)
Age of the parent (M±SD)	36.4±4.15
Educational Qualification	
1. Illiterate	5 (1.6%)
2. Less than secondary school	20 (6.6%)
3. Diploma	12 (3.9%)
4. Bachelor	246 (80.7%)
5. Postgraduate studies	22 (7.2%)
Monthly income (in Saudi Riyal (SAR))	
1. Less than 5000	31 (10.2%)
2. 5001-less than 10000	113 (37%)
3. 10000-less than 15000	90 (29.5%)
4. More than 15000	71 (23.3%)
Living region	
1. Urban	219 (71.8%)
2. Rural	86 (28.2%)

age of the child (4-7, 7-10, 10-14), age of the parent (report in mean plus/minus standard deviation), educational qualification of the parent (illiterate, less than secondary, diploma, bachelor, postgraduate studies), monthly income (less than 5000 SAR, 5001-10000 SAR, 10001-15000 SAR, more than 15 000 SAR), living area (urban, rural).

Table 2 provides insights into parental perceptions and external interest regarding childhood obesity. The majority of parents viewed obesity as a disease ( $n=260$ , 85.2%). A small fraction did not share this perception ( $n=26$ , 8.5%), and a few were unsure ( $n=19$ , 6.2%).

When questioned about their child's weight, just over half the parents characterized their child as obese ( $n=156$ , 51.1%). Around 40% perceived their child's weight to be normal ( $n=123$ , 40.3%), while a small percentage identified their child as underweight ( $n=26$ , 8.5%). When it came to external interest in their child's weight, parents were almost evenly split, with roughly half saying someone had shown interest ( $n=155$ , 50.8%), and the other half stating no such interest had been expressed ( $n=150$ , 49.2%). Of those who affirmed external interest, many did not provide details ( $n=172$ , 56.4%). Yet, a significant proportion specified that family members and relatives had expressed interest ( $n=77$ , 24.5%), followed by physicians ( $n=37$ , 10.5%). Fewer parents reported interest from school ( $n=13$ , 3.3%), nutritionists ( $n=7$ , 2.3%), or the community ( $n=5$ , 1.0%).

**Table 2. Parental Perceptions and External Interest Regarding Childhood Obesity**

Questions/Responses	Frequency	Percent
<b>Do you think obesity is a disease?</b>		
Yes	260	85.2%
No	26	8.5%
I don't know	19	6.2%
<b>What is your impression of your child's weight?</b>		
Normal	123	40.3%
Obese	156	51.1%
Underweight	26	8.5%
<b>Has anyone ever shown interest in your child's weight?</b>		
No	150	49.2%
Yes	155	50.8%
<b>If the answer is yes, mention them</b>		
No response	172	56.4%
Community	5	1.0%
Family & Relatives	77	24.5%
Nutritionist	7	2.3%
Physician	37	10.5%
School	13	3.3%

Table 3 sheds light on parental methods for identifying obesity and their understanding of Body Mass Index (BMI) measurement in children. When asked how they identify their child's obesity, the majority of parents relied on their child's shape (n=203, 66.6%) and weight (n=167, 54.8%). Only a small group of parents used BMI as a determinant (n=34, 11.1%).

Regarding familiarity with the BMI measurement method, less than half of the parents reported having prior knowledge (n=131, 43%). A larger group, however, was not familiar with this method (n=170, 55.7%). A small number of responses were not applicable (n=4, 1.3%).

**Table 3. Parental Methods of Identifying Obesity and Knowledge of BMI Measurement in Children**

Questions	Frequency	Percent
<b>How do you determine your child's obesity?</b>		
Shape	203	66.6%
BMI	34	11.1%
Weight	167	54.8%
<b>Do you have prior knowledge of the BMI measurement method?</b>		
Yes	131	43%
No	170	55.7%
NA	4	1.3%

Table 4 provides an overview of the children's dietary habits and family eating patterns. In terms of meal frequency, most children were reported to have three meals per day (n=215, 70.5%). A smaller proportion consumed two meals daily (n=69, 22.6%), while some ate more than three meals (n=12, 3.9%) or only one meal (n=9, 3.0%).

Regarding fast food consumption, a majority of parents reported that their children did not frequently

eat fast food during the week (n=196, 64.3%), while 35.7% (n=109) did.

When asked if main meals or snacks contained an abundance of sugar, parents were almost evenly split, with slightly more reporting that their children's meals and snacks did not contain high sugar (n=156, 51.1%) than those who reported that they did (n=149, 48.9%). Finally, regarding family eating patterns, more than half of the parents stated that their family had a unified system for eating meals, meaning all family members

ate their meals together regularly and in a specific place and time (n=178, 58.4%). Nevertheless, a significant portion of families did not follow such a pattern (n=127, 41.6%).

Table 5 presents information about children's digital consumption, physical activity, and exercise patterns. A notable 58.0% (n=177) of parents reported that their child typically consumes meals while spending time on electronic devices, whereas 42.0% (n=128) do not. Regarding the time children spend on electronic devices, the majority (n=114, 37.4%) spent 3-4 hours daily. This was followed by those spending more than 4 hours (n=96, 31.5%), and those spending 1-2 hours (n=66, 21.6%). A smaller proportion (n=29, 9.5%) spent less than one hour daily on electronic devices. The survey revealed that slightly more than half of the children did not engage in any physical activity (n=159, 52.1%), while 47.9% (n=146) did. Among

those who engaged in physical activity, the most popular type was football (n=66, 21.7%), followed by walking (n=26, 8.5%), and running (n=17, 5.6%). Cycling (n=12, 4.0%), light exercises (n=14, 4.6%), martial arts (n=5, 1.6%), and volleyball (n=1, 0.3%) were also mentioned.

The amount of time children spent doing physical activity varied, with the largest group spending 15-30 minutes daily (n=52, 17.0%). This was followed by 30 minutes to 1 hour daily (n=35, 11.5%), more than one hour daily (n=30, 9.8%), and 15 minutes daily (n=27, 8.9%).

As for frequency of physical activity, the majority of children were reported to engage in physical activity 2-3 times weekly (n=68, 22.3%). Daily physical activity was reported for 12.1% of children (n=37), while 8.5% (n=26) participated 4-5 times weekly, and only 4.3% (n=13) once a week

**Table 4. Children's Dietary Habits and Family Eating Patterns**

Questions	Frequency	Percentage
<b>How many meals does the child eat per day?</b>		
One meal	9	3.0%
Two meals	69	22.6%
Three meals	215	70.5%
More than three meals	12	3.9%
<b>Does the child eat fast food a lot during the week?</b>		
Yes	109	35.7%
No	196	64.3%
<b>Do main meals or snacks contain sugar in abundance?</b>		
Yes	149	48.9%
No	156	51.1%
<b>Is there a unified system for the family in eating meals and its method (all family members eat their meals together regularly and in a specific place and time)?</b>		
Yes	178	58.4%
No	127	41.6%

Table 6 displays the various health problems reported by parents of obese children. The most frequently mentioned health issue was classified as 'Other', which included one-time reported problems such as Urinary Tract Infections (UTI) and Dyslipidemia, with a prevalence of 22.3% (n=68). This was followed by blurred vision reported by 12.5% (n=38) of parents. Among other health problems, snoring and lack of self-confidence were each reported by 7.9% (n=24) of parents. Acne was reported by 7.2% (n=22), while 6.6% (n=20) of parents reported eczema. Sleep apnea and headache were reported by 5.2% (n=16) and 6.2% (n=19) of parents respectively.

Additional health concerns such as Gynecomastia and chronic constipation were each reported by 4.9% (n=15) of parents. Increased skin pigmentation and involuntary urination were reported by 4.6% (n=14) and 4.3% (n=13) of parents respectively. Other concerns such as intense hair growth, persistent sleepiness during the day, and GERD were reported by 3.3% (n=10), 2.3% (n=7), and 2.3% (n=7) respectively. Lastly, irregular periods and depression were mentioned by 2.6% (n=8) and 2.0% (n=6) of parents, while recurrence of urinary infections was the least reported issue with a frequency of 1.0% (n=3).

**Table 5. Children's Digital Consumption, Physical Activity, and Exercise Patterns**

Question	Frequency	Percentage
<b>Does the child eat his meals while spending his time on electronic devices?</b>		
Yes	177	58.0%
No	128	42.0%
<b>How much time does your child spend on electronic devices?</b>		
Less than one hour	29	9.5%
1 - 2 Hours	66	21.6%
3 - 4 Hours	114	37.4%
More than 4 hours	96	31.5%
<b>Does he do any physical activity?</b>		
Yes	146	47.9%
No	159	52.1%
<b>If the answer is yes, mention its type</b>		
Cycling	12	4.0%
Football	66	21.7%
Jumping	2	.7%
Light exercises	14	4.6%
Marital Arts	5	1.6%
Running	17	5.6%
Volleyball	1	.3%
Walking	26	8.5%
<b>How long does your child spend doing physical activity?</b>		
15 - 30 minutes daily	52	17.0%
15 minutes daily	27	8.9%
30 minutes - 1 hours daily	35	11.5%
More than one hour daily	30	9.8%
<b>How many times a week the child do physical activity?</b>		
Daily	37	12.1%
Once a week	13	4.3%
2 -3 times weekly	68	22.3%
4 -5 times weekly	26	8.5%

**Table 6. Frequency and Percentage of Health Problems Reported by Parents of Obese Children**

Problem	Frequency	Percentage (%)
Acne	22	7.2%
Blurred Vision	38	12.5%
Chronic constipation	15	4.9%
Depression	6	2%
Eczema	20	6.6%
GERD	7	2.3%
Gynecomastia	15	4.9%
Headache	19	6.2%
Increased skin pigmentation	14	4.6%
Intense hair growth	10	3.3%
Irregular period	8	2.6%
Lack of self-confidence	24	7.9%
Involuntary urination	13	4.3%
Persistent sleepiness during the day	7	2.3%
Recurrence of urinary infections	3	1%
Skin allergy and eczema	19	6.2%
Sleep apnea	16	5.2%
Snoring	24	7.9%
Other (one-time reported problems such as UTI & Dyslipidemia)	68	22.3

## Discussion

Childhood obesity is a major global public health concern (WHO, 2019; WHO, 2022). It is associated with numerous immediate and long-term health complications, including diabetes, heart disease, bone

and joint problems, sleep apnea, and psychological issues such as poor self-esteem (WHO, 2019). Moreover, obese children are likely to stay obese into adulthood and are more likely to develop non-communicable diseases like diabetes and cardiovascular diseases at a younger age (Reilly et al.,

2021). To effectively address this issue, understanding parental perceptions and knowledge of obesity, children's dietary habits, physical activity, and associated health issues is crucial.

The demographic profile of parents participating in the study reveals a diverse range of backgrounds and experiences, which is crucial for understanding parental perceptions of childhood obesity. The majority of parents had children in the middle childhood age range, which is a critical period for establishing dietary and physical activity habits that can persist into adolescence and adulthood. Notably, the high proportion of parents with a bachelor's degree suggests a relatively well-educated sample, which may influence their awareness and attitudes towards childhood obesity. The wide range of income levels represented in the study indicates a cross-section of economic backgrounds, potentially reflecting varying access to resources that influence dietary choices and physical activity opportunities. The predominance of parents from urban areas could be indicative of lifestyle factors characteristic of urban living, such as higher exposure to fast-food options and different recreational activity patterns compared to rural settings. These demographic factors are essential to consider as they likely shape the parental perceptions and experiences related to managing and understanding childhood obesity.

The findings from the current study are in alignment with the broader literature on obesity and highlight important aspects of parents' perception and understanding of obesity, children's eating and physical activity patterns, and health implications.

The overwhelming majority of parents in this study identified obesity as a disease, a perception aligning with the medical consensus (American Medical Association, 2013). This is an encouraging result as it suggests that there is a broad understanding of obesity as a significant health concern, not merely a cosmetic issue. Most parents classified their child's weight status accurately as obese, which is a promising finding given that accurate parental perception of their child's weight status has been linked to greater readiness to make changes towards a healthier lifestyle (Blanchet et al., 2019). The implication here is that if parents can correctly identify their child's obesity, they are more likely to support and engage in effective weight management strategies.

A relatively even split was found between parents reporting whether external interest had been shown towards their child's weight. This could be seen as an opportunity for healthcare providers, schools, and other community entities to show interest and provide guidance on managing childhood obesity, a recommendation supported by literature suggesting the positive impact of community and healthcare

support on weight management outcomes (Walker et al., 2023).

Parents primarily used their child's shape and weight to determine obesity rather than BMI, potentially indicating a gap in parental understanding of professional obesity measurements. This is noteworthy as parents' accurate understanding of BMI as an indicator of obesity can guide appropriate responses and interventions (Wang et al., 2021). Future efforts could focus on improving parental education on BMI as an accurate, objective indicator of child weight status.

The study results highlight the need for improved dietary habits and lifestyle changes. Although most parents reported that their children did not eat fast food frequently, about half reported an abundance of sugar in their children's meals or snacks. This finding is concerning as high sugar intake is linked to obesity and other health problems (Luger et al., 2018). A clear opportunity lies in promoting healthier diets and reducing sugar intake.

The finding that more than half of the families had a unified system for eating meals resonates with literature suggesting the benefits of family meals on children's dietary intake (Dallacker et al., 2018). It indicates a supportive home environment which could be leveraged for promoting healthier eating habits.

A significant proportion of children were found to consume their meals while spending time on electronic devices. This is a critical finding given research suggesting an association between screen time during meals and poorer dietary quality (Neumark-Sztainer et al., 2010). Interventions could focus on reducing screen time during meals to encourage mindful eating. Children's physical activity was an area of concern, with more than half the children not engaged in any physical activity. Literature shows the benefits of physical activity for obesity prevention and overall health (Janssen & Leblanc, 2010), so promoting regular physical activity could be a key strategy in combatting childhood obesity.

The variety of physical activities reported is an encouraging aspect, suggesting that diverse opportunities could be used to promote physical activity, from structured sports like football to more flexible activities like walking and running.

Lastly, the variety of health problems reported by parents of obese children underscores the serious implications of obesity on children's health. Given that blurred vision, snoring, lack of self-confidence, and other health problems were reported, it becomes clear that obesity is not just a matter of physical health, but also mental and social wellbeing, all of which deserve attention in the fight against childhood obesity (Rankin et al., 2016).

Despite the valuable insights gained from this study, several limitations should be acknowledged. Firstly, the study relied on self-reported data from parents, which introduces the potential for response bias and inaccuracies due to subjective perceptions. Additionally, the study's sample size was limited to 305 parents, which may not be representative of the entire population and restricts the generalizability of the findings. The study also focused on a specific demographic or geographic area, which further limits the generalizability of the results to other populations. Moreover, the cross-sectional design of the study limits our ability to establish causal relationships between variables. Longitudinal studies would provide more robust evidence on the associations between parental perceptions, dietary habits, physical activity patterns, and health outcomes in children. Finally, the study did not consider other potential confounding factors such as socioeconomic status, cultural background, and parental education level, which could have influenced the results. Future research should address these limitations to enhance the validity and generalizability of the findings.

### Perspectives: Communication, Sensitization, and Policy Recommendations

Our study highlights the critical need for enhanced communication strategies within healthcare settings to support children with obesity and their families. Effective communication should not only focus on the medical aspects of obesity but also address the psychosocial challenges these children face. Healthcare providers should be trained in empathy-driven communication techniques, ensuring they can engage in sensitive, motivational dialogues with both children and their parents.

Parental sensitization is another pivotal area our findings touch upon. The discrepancy in parents' perception of their child's weight status underscores the need for educational programs that can accurately inform parents about the health risks associated with childhood obesity and the importance of early intervention. These programs should aim to bridge the "weight perception gap," empowering parents to recognize obesity and its potential consequences.

Our results also point toward a significant role for national health authorities in mitigating the childhood obesity epidemic. We recommend the following policy actions:

- **Promotion of Sugar-Free Products:** Encourage the production and consumption of sugar-free or low-sugar food products. Policies could include tax incentives for manufacturers, clearer labeling for consumers, and public awareness campaigns about the benefits of reduced sugar intake.

- **Media Actions:** Leverage media platforms to promote healthy lifestyles and eating habits. This could involve public service announcements, educational programming, and social media campaigns designed to engage children and parents alike.

- **School-Based Interventions:** Implement comprehensive school health programs that include nutrition education, physical activity opportunities, and screenings for obesity-related health issues. These programs should aim to create a supportive environment for all children to learn about and practice healthy behaviors.

By addressing these areas, we can create a multifaceted approach to combating childhood obesity, involving healthcare providers, parents, and policy-makers in a concerted effort to improve public health outcomes.

### Conclusion

In conclusion, this study shed light on various aspects of parental perceptions, children's dietary habits, physical activity patterns, and associated health problems related to childhood obesity. The findings revealed mixed parental perceptions of obesity as a disease, with a significant proportion viewing it as a disease while some had differing opinions. Parental methods of identifying obesity varied, with many relying on visual cues rather than utilizing standardized measurements like BMI. Children's dietary habits showed a range of meal frequencies and the presence of sugary foods, while family eating patterns displayed a mix of unified and non-unified approaches. Digital consumption was prevalent among children, and physical activity levels varied. Importantly, parents reported a number of health problems associated with obesity in their children. These findings provide valuable insights for healthcare professionals, policymakers, and researchers to develop targeted interventions and educational programs aimed at preventing and managing childhood obesity effectively.

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